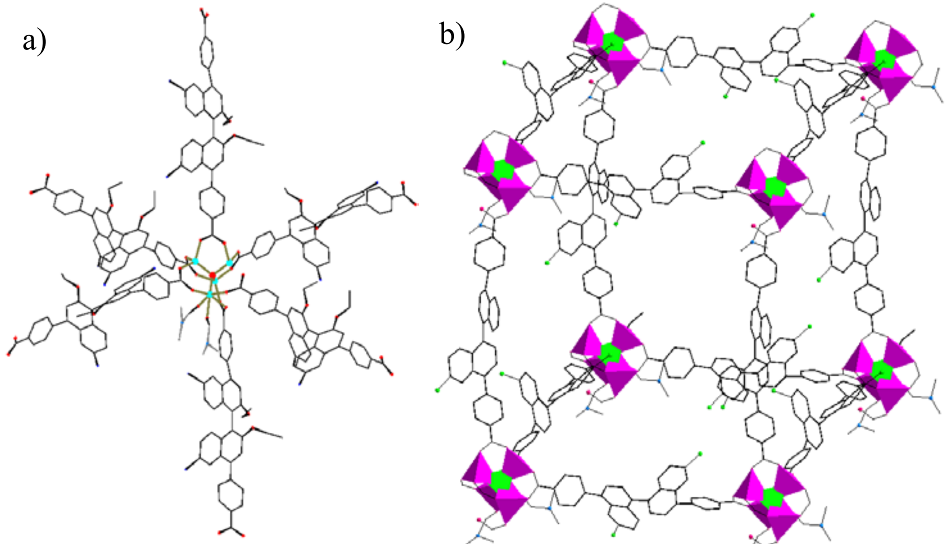
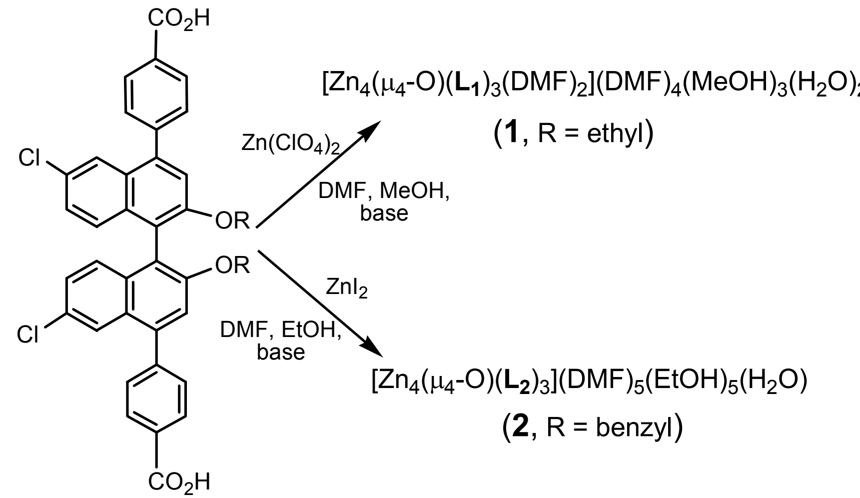
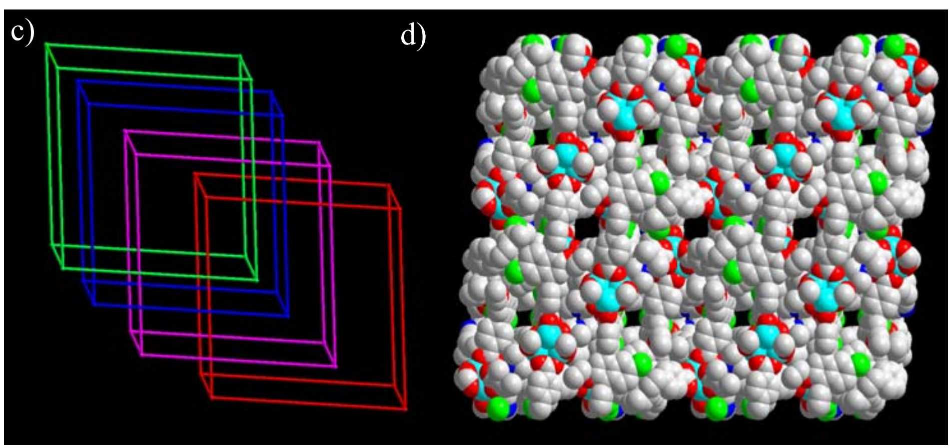
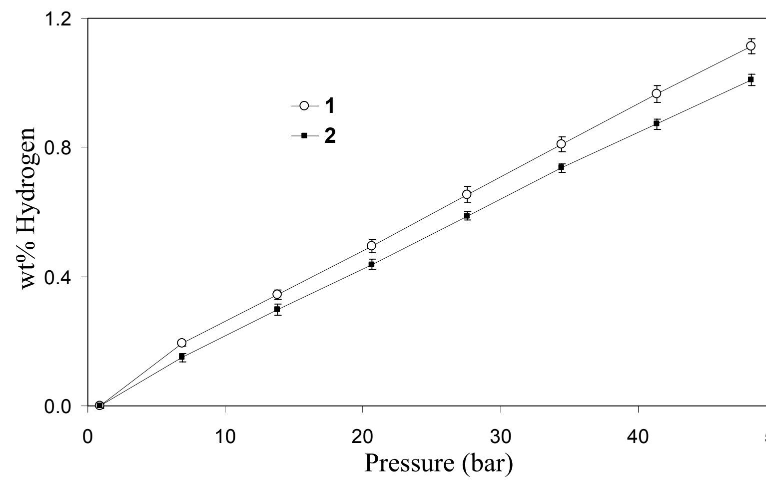
Crystal Engineering of Acentric and Chiral Coordination Networks

Wenbin Lin, University of North Carolina at Chapel Hill, DMR-0231925









Highly interpenetrated metal-organic frameworks based on new aromatics-rich bridging ligands exhibit permanent porosity and hydrogen uptakes comparable to those of the best reported for carbon nanotubes and MOFs. Interpenetrating nature of these MOFs points to a new design strategy for hydrogen storage materials by placing H_2 molecules in close proximity with several aromatic rings from the interpenetrating networks.

We have uncovered a new pathway to designing hydrogen storage materials by taking advantage of interpenetrating nature of metal-organic frameworks. There exists stronger interactions between the hydrogen molecules and the metal-organic framework due to the placement of hydrogen molecules in close proximity with several aromatic rings from the interpenetrating networks. New hydrogen storage materials with superior properties can be expected from future research along this line. This research will thus potentially contribute to the development of hydrogen economy proposed by the federal government.

Crystal Engineering of Acentric and Chiral Coordination Networks

Wenbin Lin, University of North Carolina at Chapel Hill, DMR-0231925

- Postdoctoral Training: Dr. Ponnaiyan Ayyappan, Dr. Yong Cui, Dr. Zhiyong Wang, and Dr. Banu Kesanli**

- Graduate Student Training: Dr. Aberdeen Allen* (Colgate-Palmolive), Dr. Owen R. Evans (Soane Labs), Dr. Ling Ma (UCLA), and Dr. Helen L. Ngo** (USDA)

- Undergraduate Student Training: David R. Manke (MIT), Gergeley Sirokman (MIT) Estee Nagar** (Univ. New Hampshire), Mary E. Chapman (MIT)**, Nissan Siegel (Ga. Tech.), and Nathan West (UNC-CH)

- High School Student Training: Andrea Locke*, ** and Lynn Tran**

- Course Development: Environmental Chemistry, Inorganic Chemistry, Organometallic Chemistry, and Physical Inorganic Chemistry

- So far 38 papers have acknowledged the support of this grant.

*African American; **Female